

**Amendment to the Claims:**

The listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1-6. Cancelled

7. (Currently Amended) A method for modeling fluid flows in a fractured ~~multi-layer~~ multilayer porous medium to simulate interactions between pressure and flow rate variations in a well through the medium, comprising:

discretizing the fractured medium by a mesh pattern with fracture meshes centered on nodes at fracture intersections with each node being associated with a matrix volume; and

determining flows between each fracture mesh and the associated matrix volume in a pseudosteady state.

8. (Previously Presented) A method as claimed in claim 7, wherein:

the medium comprises fractured layers; and

the matrix volume associated with each fracture mesh in each layer of the porous medium contains all points which are closer to a corresponding node than to neighboring nodes.

9. (Currently Amended) A method as claimed in claim 8, wherein:

each fractured layer is discretized in pixels and the matrix volume associated with each fracture mesh is defined ~~by including all pixels that are closer to the corresponding node than to the neighboring nodes~~ by determining a distance from each pixel to a closest fracture mesh.

10. (Previously Presented) A method as claimed in claim 7, comprising:

determining at any point a transmissivity value for each pair of a fracture mesh and a matrix block by considering that pressure varies linearly depending on a distance from a point being considered to the fracture mesh associated with the matrix block.

11. (Previously Presented) A method as claimed in claim 8, comprising:

determining at any point a transmissivity value for each pair of a fracture mesh and a matrix block by considering that pressure varies linearly depending on a distance from a point being considered to the fracture mesh associated with the matrix block.

12. (Previously Presented) A method as claimed in claim 9, comprising:

determining at any point a transmissivity value for each pair of a fracture mesh and a matrix block by considering that pressure varies linearly depending on a distance from a point being considered to the fracture mesh associated with the matrix block.--